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Group Art Unit: 1771

REMARKS

Claim 16 has been rejected under 35 U.S.C. § 112, second paragraph. Referring to the embodiment illustrated in Fig. 1 and described at page 5, line 29, through page 6, line 2, the backing 14 may comprise a multi-filament fiber layer 18 and a polyester film layer 20. Claim 1 has been amended to recite a "backing fixed as a layer" to the fleece layer rather than a "backing layer." The recitation of a "backing" is consistent with the specification and is believed to obviate any confusion with the further use of the term "layer" in dependent claim 16. Accordingly, this rejection is believed to be overcome.

Claims 1, 3, 4, 8, 9, 12, 17, and 18 have been rejected under 35 U.S.C. § 102(b) over Lickfield et al. (US Pat. No. 5,804,512). Independent claim 1 recites a nonwoven fleece layer comprising a blend of natural fibers and synthetic fibers. The ratio by weight of natural fibers to synthetic fibers ranges between 95% natural fibers and 5% synthetic fibers to 50% natural fibers and 50% synthetic fibers.

Lickfield does not disclose, teach, or suggest such a fleece layer. Lickfield discloses a ply 16 that is a non-woven web that may comprise a mixture of thermoplastic staple fibers and absorbent fibers (col. 4, lines 18-20). Lickfield lists possible

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components for the thermoplastic and natural fibers (col. 3, lines 61-67; col. 4, lines 6-15). However, Lickfield is silent as to the ratio of natural to synthetic fibers. Lickfield indicates only that the natural fibers should be in an amount sufficient to impart absorbency characteristics to the web, which suggests using only the minimum amount needed to achieve this function. In the present invention, the natural fibers range from 50 to 95% by weight. Thus, there is no teaching in Lickfield to provide a ratio of natural to synthetic fibers ranging from 95:5 to 50:50, as in the presently claimed invention.

Furthermore, Applicant's invention relates to a buffing or polishing material and comprises a fleece layer and dimensionally stable backing. Lickfield relates to a non-woven laminate fabric useful as a barrier component in medical fabrics, such as sterile wraps, surgical gowns and the like (col. 2, lines 17-20; col. 3, lines 48-51). The fabric in Lickfield has superior barrier properties and is flexible and soft (col. 2, lines 15-17) and can be folded for wrapping items to be sterilized (Figs. 2A, 2B). Lickfield notes that the fabric is also useful in other applications where barrier properties would be desirable (col. 3, lines 51-54).

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One of skill in the field of polishing or finishing articles would not have considered the fabric of Lickfield, which is employed in a completely different technical field. A skilled person in the polishing field would have recognized that a non-woven laminate fabric for medical or other barrier applications has properties that are not suitable for polishing or finishing articles. Lickfield provides no indication that the disclosed non-woven laminate fabric could be useful for purposes other than the disclosed medical or barrier applications. Accordingly, Applicant submits that claim 1 and the claims dependent therefrom are patentable over Lickfield.

Claims 1, 2, 5-12, and 14-25 have been rejected under § 103(a) over Arnold (US Pat. No. 5,989,113) in view of Berger et al. (US Pat. No. 5,482,756). Reconsideration and withdrawal of this rejection is respectfully requested for the following reasons.

Arnold relates to a tool for mechanical surface treatment comprising a processed fleece of fibers produced by exclusively mechanical processes. Arnold discloses that the fibers of the fleece can be natural, artificial or synthetic and can be mixed. However, Arnold fails to disclose or suggest a backing fixed to the fleece layer, as recited in claim 1. The Examiner cites Berger

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as supplying a teaching to modify Arnold to include a backing layer. Applicant submits that this combination is not proper, as set forth as follows.

Arnold and Berger relate to different types of surface treating or finishing tools. Arnold relates to disks or rings that are fastened annularly about a core, whereby only a circumferential part of the disk or ring is used for polishing. Arnold discloses a number of different examples of how to use such a fleece. One example is the folding of at least one fleece layer that is cut to size and secured radially about the solid core (col. 4, lines 37-40). Another example describes laying at least two discs upon another and connecting these by a center piece and/or through quilting (col. 4, lines 49-52). Further, another example for a mechanical surface treatment tool is described as cutting the fleece layer into strips and fastening either these individual fleece leaves or fleece leaf packets to a continuous support by quilting, gluing or riveting (col. 7, lines 16-21). These various polishing pad structures allow the polishing pad to be automatically ventilated during rotation and to be pliable to envelop or wrap the part to be polished. A honeycomb is formed at the periphery to hold polishing paste (col. 1, lines 53-59).

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In contrast, Berger relates to a substantially flatter material that does not incorporate any of the folds, pleats, or leaf structures of Arnold. The backings with which Berger is concerned are not compatible with the tool of Arnold. For example, Berger teaches encapsulating the fibrous backside of a non-woven web by a polymeric layer. In Berger, this polymeric layer is a fluid composition that flows around the fibrous backside and hardens in a controlled manner (col. 4, lines 50-53). The non-woven web is described to be lofty, open, low-density and fibrous and may be of any synthetic fiber (col. 3, lines 30-32; col. 1, lines 32-33). This teaching of encapsulating the backside of an abrasive layer is not compatible or combinable with the various embodiments disclosed by Arnold. Similarly, the other forms of backing mentioned by Berger (col. 1, lines 32-50), noted by the Examiner, are not compatible with the structure of Arnold. Therefore, the skilled person would not have combined Berger with Arnold to arrive at the present invention, and claim 1 and the claims dependent therefrom are believed to be patentable thereover.

Further, neither Arnold nor Berger provide any indication that a specific mixture of natural and synthetic fibers contribute to the enhancement of the strength and dimensional stability of

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the material or allow the material to be used at a higher working surface heat level. As disclosed in Applicant's specification, the natural fibers act as an insulation for the material, preventing the synthetic fibers from melting and imparting an undesirable residue on the working surface and allowing the material to be used at a higher working surface heat level (page 12, lines 4-28). Also, the synthetic fibers strengthen the material by melting and chemically bonding to the natural fibers and other synthetic fibers during the manufacture of the material (page 4, line 23, to page 5, line 17). The synthetic fibers also prevent pilling or shedding of the fleece on the working surface (page 5, lines 11-13).

Neither Arnold nor Berger disclose or suggest a ratio of natural to synthetic fibers ranging from 95:5 to 50:50, as in claim 1. As noted above, these amounts of fibers provide specific advantages not described or suggested in the art. Accordingly, when considering all the recitations of claims 1 and 25, these claims and the claims dependent from claim 1 are believed to be patentable over Arnold in view of Berger for this reason as well.

Dependent claim 6 recites that the fleece layer, which is needle punched to the backing, forms loops on an outer side of the backing. The loops can be fastened directly to hooks on polishing

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or finishing equipment. Berger does not disclose or suggest the formation of loops on an outer side of a backing. Rather, in Berger, fiber ends protrude through a woven cloth. However, there is no indication that such ends form loops that can be used for subsequent attachment to hooks on polishing equipment. Accordingly, claim 6 is believed to be patentable over Arnold in view of Berger for this reason as well.

Claim 13 has been rejected under § 103(a) over Arnold in view of Berger et al. and further in view of Matsunaga et al. (US Pat. No. 5,554,442). Claim 13 recites that the chemically binding fibers comprise polyester fibers having a lower melting temperature than a remainder of the synthetic fibers or of the natural fibers. As noted above, this portion of the synthetic fibers strengthens the material by melting and chemically bonding to the natural fibers and other synthetic fibers during the manufacture of the material. Furthermore, the natural fibers act as an insulation, preventing the synthetic fibers from melting and imparting an undesirable residue on the working surface during use and allowing the material to be used at a higher working surface heat level. The synthetic fibers also prevent pilling or shedding of the fleece on the working surface. Thus, the claimed recitation provides an advantage not taught by the prior art.

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Matsunaga discloses a nonwoven fabric incorporating a binder fiber that includes ϵ -caprolactone as a polyester component. The resulting fabric has a soft hand and is unlikely to flatten after repeated compressions or in a high temperature environment. Matsunaga lists as applications for this fabric filters, interlinings, shoulder paddings, furniture stuffing, and automotive seat cushions (col. 1, lines 10-22; col. 4, line 46, through col. 5, line 17). There is no disclosure that this fabric would be suitable for polishing pads. The Examiner asserts the motivation is that the fiber has a low melting point and produces a fabric that is resistant to flattening during prolonged use. However, it is not obvious that a low melting point fiber would be suitable for a polishing pad, since one of skill in the art would know that such a fiber could melt during use and may impart an undesirable residue on the piece to be polished (Applicant's specification, page 15, lines 7-12). Furthermore, there is no indication in the art of record that one of skill in the art of surface treatment would be concerned with providing a resistance to flattening during prolonged use. The resistance to flattening with which Matsunaga is concerned relates to items such as seat cushions, which are subject to much different conditions during use, namely, repeated compressions over a lengthy period (col. 4,

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line 64, through col. 5, line 6). In contrast, the surface treating tools of Arnold have a limited service life and must be frequently changed (col. 2, lines 14-15). Accordingly, there is no motivation to modify Arnold to incorporate the binder fiber of Matsunaga, and claim 13 is believed to be patentable thereover.

New independent claim 26 is generally similar to claim 1, but recites a nonwoven fleece layer comprising a blend of natural fibers and synthetic fibers, the synthetic fibers comprising no more than 50% by weight of a ratio of natural fibers to synthetic fibers. This claim also includes recitations from dependent claims 2, 5, and 12. Thus, claim 26 recites that at least a portion of the synthetic fibers include fibers chemically bound to others of the synthetic fibers and the natural fibers. Also, the natural fibers and the synthetic fibers are needle punched together, and the fleece layer is needle punched to the backing.

The invention as recited in this claim provides the advantages of the strong, dimensionally stable buffing or polishing material provided by the needle punching of the fibers fleece layer as well as the additional needle punching of the fleece layer to the backing. The synthetic fibers comprising no more than 50% by weight contributes to the strength and dimensional stability while also allowing the material to be used

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at a higher working surface heat level, whereby the natural fibers act as an insulation for the material. The prior art of record does not disclose or suggest this advantageous combination of elements. Accordingly, new claim 26 is also believed to be patentable thereover.

New dependent claims 27-47 correspond to claims dependent from claim 1. These claims are believed to be patentable for the reasons set forth above with respect to claim 26.

In view of the above amendments and remarks, all claims are believed to be in condition for allowance, and reconsideration and indication thereof is respectfully requested. The Examiner is encouraged to telephone the undersigned attorney to discuss any matter that would expedite prosecution of the present application.

Respectfully submitted,

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MARKED-UP VERSION OF AMENDMENTS

1. (Amended) A buffing or polishing material comprising:

a nonwoven fleece layer comprising a blend of natural fibers and synthetic fibers, a ratio by weight of natural fibers to synthetic fibers ranging between 95% natural fibers and 5% synthetic fibers to 50% natural fibers and 50% synthetic fibers; and

a backing ~~layer~~ fixed as a layer to the fleece layer, the backing ~~layer~~ having a greater strength and a greater dimensional stability than the fleece layer.

3. (Amended) The material of claim 1, further comprising a nonwoven fusible layer interposed between the fleece layer and the backing ~~layer~~.

5. (Amended) The material of claim 1, wherein the fleece layer is needle punched to the backing ~~layer~~.

6. (Amended) The material of claim 5, wherein the fleece layer forms loops on an outer side of the backing ~~layer~~.

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16. (Amended) The material of claim 1, wherein the backing layer comprises a multi-filament polyester fiber layer and a polyester film layer.

17. (Amended) The material of claim 1, wherein the backing layer comprises a nonwoven material, a woven cloth, a film, a spunbond material, a scrim, or a loop fabric.

18. (Amended) The material of claim 1, wherein the backing layer has a break strength greater than the fleece layer and an elongation at break less than the fleece layer.

23. (Amended) The material of claim 1, wherein the backing layer is configured to fasten to a polishing, buffing, or finishing tool.

25. (Amended) A buffing or polishing material comprising:

a nonwoven fleece layer comprising a blend of natural fibers and synthetic fibers;

a backing layer fixed to the fleece layer, the backing layer having a greater strength and a greater dimensional stability than the fleece layer; and

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wherein the material has a break strength of at least 425 pounds per linear inch in the machine direction and an elongation at break of no more than 2%.

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